bition is to illustrate the history and development of photography, and to show the numerous and important applications of the art to science, art, and industry. All objects selected for exhibition will be chosen with the view of promoting the educational value of the collection. The elements of competition and trade will not enter into the Exhibition, nor will there be any prize offered to exhibitors. Portraits will be shown only in so far as they may serve to illustrate the various methods of portrait photography, or special features of size, treatment, &c. Landscapes may be accepted on account of the interest of the subject, as well as for technical excellence. Reproductions of art objects will be received both as illustrations of processes and for the artistic interest and importance they possess. Communications respecting the business of the Exhibition should be addressed to the Secretary of the Museum and Galleries Committee, Town Council, Glasgow.

MR. GEORGE R. ROGERSON, an old pupil of the College, has presented his valuable astronomical observatory to the Council of Liverpool College. The instruments include an equatorially-mounted refracting telescope, a spectroscope with ten prisms, a micrometer, and also an astronomical library.

AN important essay on micro-chemical reactions has just been published in Brussels by MM. Klement and Renard. Availing themselves of the published researches of Boricky, Behrens, Streng, Lehmann, Haushofer, and others, combined with the results of their own extensive researches, the authors have produced the most complete account of the subject which has yet appeared. They describe the methods of research and the reactions, simple and characteristic, by which compounds of more than fifty elementary bodies may be identified in minute crystals recognisable under the microscope. They also give a brief description of the processes of isolation and identification applicable to such compounds as the mineral constituents of rocks. The value of the treatise is much enhanced by the accompanying plates, eight in number, comprising nearly 100 figures of the forms of crystals obtained by the various reactions described in the text.

AN International Congress of Climatologists and Hydrologists is appointed to meet at Biarritz during the first week in October. The co-operation of the various medical, hydrological, and meteorological societies of France has been received; the Minister of Commerce will open the first meeting on October 1, and Dr. Durand-Fardel of Paris will be the President. The object of the Congress will be to assemble specialists from every country to discuss questions connected with hydrology and climatology. Excursions are to be made to various watering-places in the Pyrenees.

THE sale of a considerable portion of the celebrated Godeffroy Ethnological Collection from the South Sea Islands, at Hamburg, to the Leipzig Museum, has already been recorded. The portion thus sold appears to have been mortgaged by the owner, and the sale was made by the mortgagees. The remaining part, which was not mortgaged, and which included very valuable zoological and palæontological collections, as well as a comprehensive collection of woods from the South Seas, has just been purchased by the city of Hamburg for 85,000 marks.

MRS. OGILVIE, of Sizewell House, has presented 1300*l.* to the Ipswich Museum, to clear off the debt attaching to the building.

THE Municipal Council of Paris at its sitting of the 29th ult. resolved to vote a sum of 5000 francs to M. Georges Poucher, to enable him to continue his investigations into the course of the Gulf Stream.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus* ♀) from India, presented by Mrs. Carter; a Black-eared Marmoset (*Hapale penicillata*) from South-East Brazil, presented by Mr. A. Evershed; two Three-toed Sloths (*Bradypus tridactylus*) from British Guiana, presented by Capt. Hicks; a Crested Porcupine (*Hystrix cristata*) from Ceylon, presented by Miss C. S. Simpson; a Crested Porcupine (*Hystrix cristata*) from South Africa, presented by the Rev. G. H. R. Fisk, C.M.Z.S.; a Black-backed Jackal (*Canis mesomelas*) from South Africa, presented by Mr. John Hewat; an Indian Antelope (*Antilope cervicapra*) from India, presented by Capt. J. C. Robinson; a Herring Gull (*Larus argentatus*), British, presented by Capt. H. G. Alexander; a Ceylonese Hanging Parrakeet (*Loriculus asiaticus*) from Ceylon, presented by Mr. C. W. Rosset; a Clouded Tiger (*Felis macroceiis*) from Assam, a Burchell's Zebra (*Equus burchelli* ♂) from South Africa, two Globose Curassows (*Crax globicera* ♀ ♀) from Central America, deposited; two Black-footed Penguins (*Spheniscus demersus*) from South Africa, purchased; a Lesser Koodoo (*Strepsiceros imberbis* ♂) from Somali Land, a Ruddy Sheldrake (*Tadorna casarca*), European, received in exchange; two Black-backed Jackals (*Canis mesomelas*), an Eland (*Oreas canna* ♂), born in the Gardens.

## OUR ASTRONOMICAL COLUMN

PARALLAX OF NOVA ANDROMEDÆ.—Prof. Asaph Hall, writing under date February 12, in the *American Journal of Science*, states that this star was then very near the limit of visibility in the great refractor of the Washington Observatory. It had thus in five months faded down from "the limit of visibility to the naked eye to that in a 26-inch telescope." Led by the suggestion of Prof. Peters that it would be interesting to test the parallax of such a star, Prof. Hall began on September 29 a series of measures of the Nova, referring it by means of polar co-ordinates to a known star of the eleventh magnitude, distant from it a little less than 2′. The measures do not, in Prof. Hall's opinion, show any proof of a parallax, though they indicate perhaps a diminution of the apparent distance from the comparison star. The variation in the brightness of the star would, however, be likely to affect the measures. The star was too faint for the measures to be continued after February 7.

Prof. Hall mentions favourably Mr. W. H. Monck's suggestion (*Observatory*, vol. viii. p. 335) that the Nova may have been a swiftly-moving star "that in rushing through the nebula had been set on fire like a meteor in our atmosphere."

M. LŒWY'S METHOD OF DETERMINING THE ELEMENTS OF REFRACTION.—Mr. Gill, writing on the subject of M. Lœwy's proposal to determine the elements of refraction by means of a reflecting prism placed in front of the object-glass of an equatorial (NATURE, vol. xxxiii. p. 303), whilst expressing his appreciation of the merits of the French *savant's* scheme, suggests that, in place of having the tube of the telescope fixed and the prism movable with respect to it, it would be better to have the prism rigidly attached to the objective, the micrometer threads being parallel to the line of intersection of the reflecting surfaces of the prism, and the whole tube capable of rotation round its axis. By this arrangement a sufficiently firm connection would be established between the prism and the micrometer, and the necessity of calculating the direction of the line of measurement by the latter would be entirely obviated. It is also pointed out by Mr. Gill that the carrying out of M. Lœwy's plan necessitates the construction of a complete special apparatus, but that it would be comparatively easy to adapt the modern heliometer to this kind of observation. It would only be necessary to mount the prism symmetrically in front of the object-glass, so that the line of intersection of the reflecting surfaces should be at right angles to the line of section of the object-glass, and to the axis of the heliometer. The observations would then be made by bringing the images of the two stars into coincidence near the centre of the field by symmetrical movements of the segments of the objective, as in the ordinary process of measurement with this instrument. This method of observation is, in Mr. Gill's opinion, the most convenient and the most accurate of all those known at the present time, and

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the advantage of precisely simultaneous measures is a point of considerable importance when one of the stars is at a low altitude which is rapidly varying.

DISCOVERY OF MINOR PLANETS.—Four new minor planets were discovered in less than a week by Herr Palisa at the Vienna Observatory—Nos. 254 and 255 on March 31, No. 256 on April 3, and No. 257 on April 5. All are about the thirteenth magnitude.

## *ASTRONOMICAL PHENOMENA FOR THE WEEK* 1886 *APRIL* 18-24

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

*At Greenwich on April* 18

Sun rises, 5h. 0m.; souths, 11h. 59m. 16·8s.; sets, 18h. 59m.; decl. on meridian, 10° 54′ N.: Sidereal Time at Sunset, 8h. 46m.

Moon (Full) rises, 18h. 58m.; souths, 0h. 24m.*; sets, 5h. 42m.*; decl. on meridian, 9° 13′ S.

| Planet | Rises | Souths | Sets | Decl. on meridian |
|---|---|---|---|---|
| | h. m. | h. m. | h. m. | ° ′ |
| Mercury | 4 34 | 11 4 | 17 34 | 5 11 N. |
| Venus | 3 36 | 9 9 | 14 42 | 6 5 S. |
| Mars | 13 43 | 20 47 | 3 51* | 11 42 N. |
| Jupiter | 15 51 | 22 7 | 4 23* | 2 19 N. |
| Saturn | 8 16 | 16 28 | 0 40* | 22 51 N. |

* Indicates that the southing or setting is that of the following morning.

*Occultation of Star by the Moon* (visible at Greenwich)

| April | Star | Mag. | Disap. | Reap. | Corresponding angles from vertex to right for inverted image |
|---|---|---|---|---|---|
| | | | h. m. | h. m. | ° ° |
| 18 | κ Virginis | 4½ | 21 5 | 21 48 | 349 273 |

| April | h. | |
|---|---|---|
| 18 | 6 | Mars stationary. |
| 21 | 14 | Mercury stationary. |

*Places of Comet Fabry.*

| 1886 | R.A. | Decl. | Log Δ | Brightness. |
|---|---|---|---|---|
| | h. m. s. | ° ′ | | |
| April 18 | 0 13 47 | 37 53 N. | 9·628 | 145 |
| 22 | 0 58 58 | 33 58 | 9·504 | 230 |

*Places of Comet Barnard.*

| 1886 | R.A. | Decl. | Log Δ | Brightness. |
|---|---|---|---|---|
| | h. m. s. | ° ′ | | |
| April 18 | 1 43 58 | 37 41 N. | 0·109 | 37 |
| 22 | 1 41 36 | 39 2 | 0·075 | 54 |

The comet places are for Berlin midnight.

*Variable-Stars*

| Star | R.A. | Decl. | | | |
|---|---|---|---|---|---|
| | h. m. | ° ′ | | h. m. | |
| S Cancri | 8 37·4 | 19 27 N. | Apr. 23, | 23 41 | *m* |
| R Leonis | 9 41·4 | 11 57 N. | ,, 23, | | *m* |
| U Virginis | 12 45·3 | 6 10 N. | ,, 24, | | *M* |
| W Virginis | 13 20·2 | 2 47 S. | ,, 18, | 0 0 | *M* |
| δ Libræ | 14 54·9 | 8 4 S. | ,, 18, | 3 52 | *m* |
| U Coronæ | 15 13·6 | 32 4 N. | ,, 23, | 4 10 | *m* |
| S Libræ | 15 14·9 | 19 59 S. | ,, 22, | | *m* |
| S Ophiuchi | 16 27·7 | 16 55 S. | ,, 19, | | *M* |
| U Ophiuchi | 17 10·8 | 1 20 N. | ,, 18, | 8 30 | *m* |
| | | | and at intervals of | 20 8 | |
| X Sagittarii | 17 40·4 | 27 47 S. | Apr. 21, | 2 20 | *m* |
| | | | ,, 24, | 0 0 | *M* |
| δ Cephei | 22 24·9 | 57 50 N. | ,, 24, | 0 0 | *m* |

*M* signifies maximum; *m* minimum.

*Meteor Showers*

The present week is one usually rich in meteors, but moonlight will interfere with observation this year. The most interesting shower, the *Lyrids*, radiant R.A. 274°, Decl. 34° N., April 18–20, has been poorly represented of late years. Several radiants from Cygnus and Draco are usually active from April 19 to April 23.

## *GEOGRAPHICAL NOTES*

THE greater part of the contents of the current number of *Petermann's Mittheilungen* is devoted to the geography of the African continent. In the first paper (which is accompanied by an excellent map) Dr. Chavanne describes his journey from the Lower Congo to San Salvador and the Arthington Falls, as well as other explorations in Portuguese West Africa. The position of many hitherto unsettled points is now defined. The traveller states that he paid particular attention to the question of the population and its density. He counted the huts in the places through which he passed, and endeavoured to obtain from the natives details of the houses within 5 kilometres on each side of his route, and he comes to the conclusion that the estimates of some previous travellers are greatly exaggerated. Dr. Lenz communicates some observations on the Congo, and Prof. Kirchhoff writes a short but important article on the hydrography of the Muta Nsige. Dr. Karl Lechner gives the history and present condition of what he styles a "language island" in Moravia, a kind of oasis in this province of Slavs, in which the German, or a kind of German, language has been preserved by the people for centuries. The place is Wischau, not far off the high road between Brün and Olmütz. The people call themselves Schwoben, and in the struggle for the maintenance of their nationality they have been assisted by the Tyrol and Bavaria. Dr. Müller defends his edition of the Arabian geography of Hamdânî against the strictures of Herr Glaser in his recent account of his Arabian journeys.

THE *Verhandlungen* (Bd. xiii. No. 3) of the Geographical Society of Berlin contains an account by Lieut. Francois, of his journeys in the southern basin of the Congo. He accompanied the Wissmann Expedition to Kassai, and also Mr. Grenfell on his journey on the Lulongo and Chuapa, and he describes some of the incidents and observations of these journeys. Dr. Moritz, who proceeded to Syria in 1884, on behalf of the Archæological Institute of Berlin, read a paper on the geographical experiences of his journey. A brief communication from Dr. Sievers recounting his work in Columbia is also published.

THE Foreign Department of the Würtemberg Government has invited the Governments of Austria, Bavaria, Baden, and Switzerland to join in a common and simultaneous investigation of the depths of Lake Constance, and the preparation of a chart of it. The proposition is that a commission of specialists from all these States should meet at Friedrichshafen to settle the extent, methods, and time for the investigation. The Swiss Assembly has welcomed the proposal, more especially as the Swiss have already carried out a considerable part of the work as far as their portion of the trade is concerned.

SOME time since we noticed the success of two officers of the French navy, Capt. Réveillère and Lieut. Fesigny in a daring attempt to ascend the rapids of the Meikong when the river was in full flood. The Colonial Council of Cochin China has now passed a resolution affirming the necessity for organising a mission of engineers or naval officers to enter into a complete and minute study of the Meikong rapids at low water. These rapids are all that prevent access from the sea by the Meikong to Hung-Tseng, Luang-Prabang, and beyond even to Kiang-hung and the Shan States up to the Chinese border.

FURTHER details of Mr. Charles Winnecke's plan of that part of South Australia crossed by the overland telegraph, to which we have already referred, are supplied in a late issue of the *Colonies and India*. The survey shows that the distance from Tennant's Creek eastwards over the rivers Buchanan, Rankine, James, Herbert, and Milne, is 1626 miles. The country continually rises from Port Augustus till Burt Plain on the MacDonnell ranges—a distance of 1000 miles—is reached, after which it falls gradually to the boundary. Mr. Winnecke has included in his plan every camping-place along the telegraph line. He asserts that Lake Eyre is a considerable depth below the sea-level, a statement which he made in 1877, but which has been disputed. The highest point along the route was the Burt Plains in the MacDonnell ranges, which are 2532 feet above the sea-level, but the ranges themselves are several thousand feet higher. The telegraph station of Central Australia,

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